

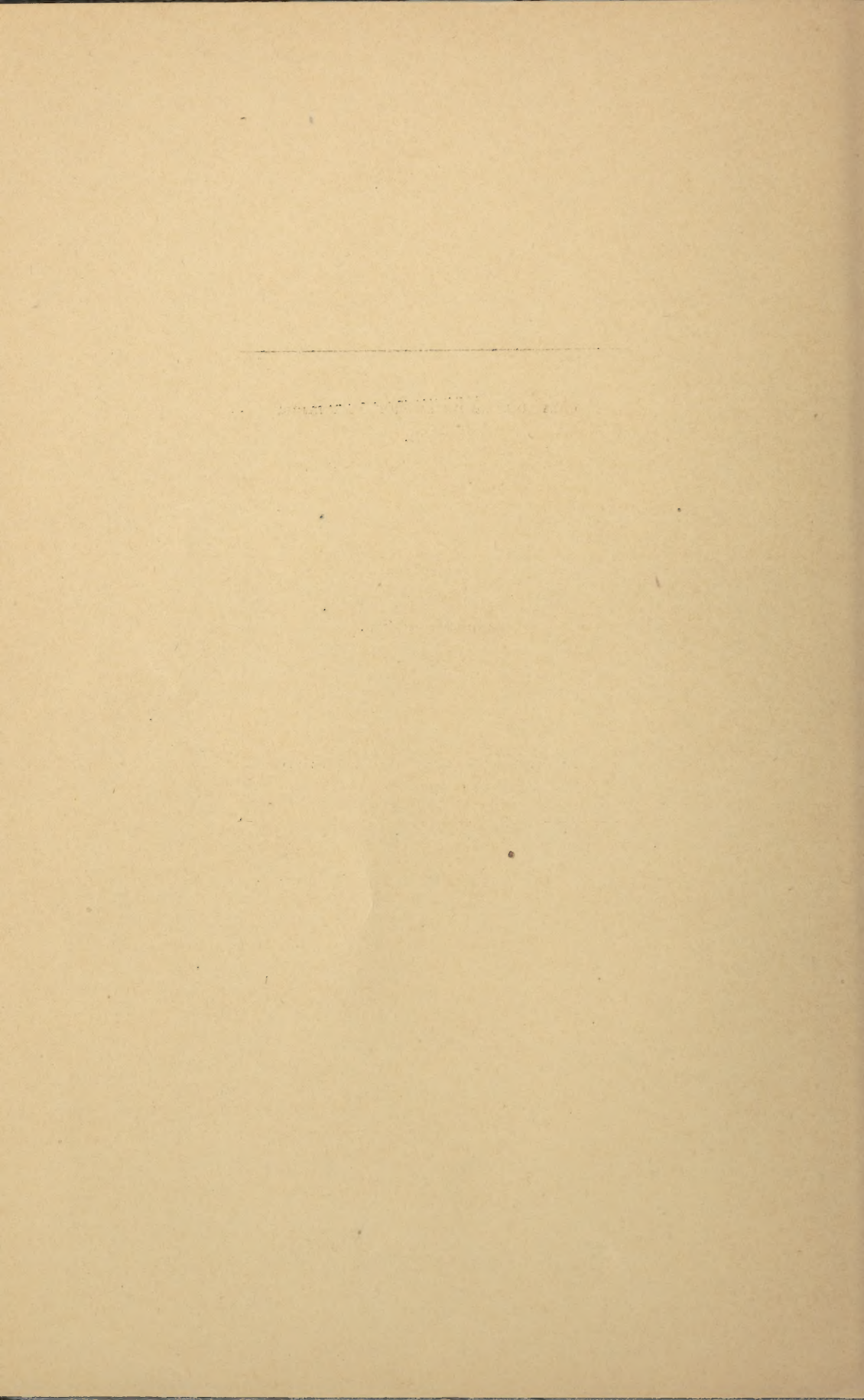
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Section.

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OPIUM AND CATHARSIS AFTER ABDOMINAL SECTION.*

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The use of opiates in any form after abdominal operations has been strongly condemned by some of our most successful operators and equally strongly advocated by others. To aid me in investigating the question as to which view is correct, I sent a copy of the following letter to each of four well-known and successful operators :

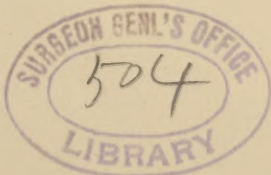
"DEAR DOCTOR : I am studying the effect of opium (in some form) after abdominal section. . . . Will it be asking too much that you give me your views on the subject and the reasons therefor . . . ?"

Dr. A. C. Bernays, of St. Louis, says : "I have not permitted the administration of opium or morphine in any way in the last six hundred cases I have done . . . and my results have been gratifying, to say the least. I strongly advise against laparotomy in any case of appendicitis or intestinal obstruction when opium has been given by the medical attendant for several days (this statement should include cases of ruptured tubal pregnancy and nearly all intra-abdominal lesions that might require a section). If the operation is done under such circumstances the death-rate will be three or four times greater than in cases where no opiate has been given."

Dr. J. F. W. Ross, of Toronto, Canada, says, in speaking of purgation and opium :

"If a case has no symptoms of distention, nothing is given to open the bowels until the fourth day ; then a little calomel or licorice powder is administered, together with an enema of soapsuds. If distention begins to cause pain, I give at once one grain of calomel every fifteen minutes until eight grains have been administered or else two grains every half-hour until the same dose has been reached. The size of each single dose given depends on the condition of the stomach. A one-grain dose placed on the tongue seems to produce

* Read by invitation at a meeting of the New York Obstetrical Society, January 16, 1894.



less reverse peristalsis than a two-grain dose ; the relief from flatus, and therefore from pain, is very marked, even though no motion of the bowels takes place.

"If any one wishes to try this, let him eat a hearty dinner and be compelled to retain the flatus formed during the process of digestion ; pain in the abdomen will soon come on and, if the flatus is not relieved, the pain will become quite intense.

"After the calomel, one or two Seidlitz powders or doses of sulphate of magnesia are given every half-hour and I do not hesitate to give two or three compound cathartic pills with the sugar coating removed. In the face of this, it seems that it is unwise to use opium unless called for by prolonged pain producing loss of sleep. In many of these cases, if the patient has a tendency to remain awake for the first night, a hypodermic of not more than an eighth of a grain of the sulphate of morphia should be given toward morning. The nurse should be allowed a free hand in the administration of this one dose but should not be allowed to administer more than this without the permission of the surgeon.

"In old opium takers I always keep up the use of the opium after the operation ; if this is not done they are sure to vomit until it is given, and after its administration the vomiting will quickly disappear. They have a great deal more restlessness without the opium than with it. In one or two cases I have been forced to administer large doses owing to the fact that the patients have been consuming two or three grains of morphine three or four times a day previous to the operation. It must not be expected that the administration of opium, or the want of the administration of purgatives, will kill the patient. Many a case of pus infection from rupture of a pus tube will die in spite of all the purgatives that can be administered, and flatus will be present at the time of death ; but it certainly is not the flatus that kills the patient. Without the administration of opium, flatus will be perceived in the bowel after almost every abdominal operation during the first forty-eight hours. This will be particularly noticed in cases in which the abdomen has been considerably distended by the tumor and a very lax condition of the walls remains after its removal.

"The administration of opium has a tendency, I believe, to permit of distention of the intestines by gas, but its administration is not fraught with the terrible consequences attributed to it by many operators.

"Operators at times have a tendency to run in grooves ; they seem

to absorb an idea without taking into consideration other circumstances that may modify it.

"During the last ten years so much has been written in the journals that the tyro in abdominal surgery would think that all that was required was to do an operation of the greatest magnitude, put in a drainage-tube and purge the patient, and that patient was sure to get well; but many of the operators fail to let the young beginner know that even in their hands many cases with perfect drainage and thorough purgation die if the contents of the tumor have escaped into the abdomen and infected it. I have had cases in which a very small dose of opium has produced vomiting. I have had cases in which tight ligation of a broad pedicle has produced vomiting, and if opium had been administered it would no doubt have been charged with the production of the vomiting. I have had cases in which opium has relieved persistent vomiting and then again I have had the best results in its administration to opium eaters, so that it is impossible to lay down any hard and fast rule or to make any sweeping assertions regarding its use. There is a happy intermediate course to be pursued, and this course can only be followed out after considerable experience."

Dr. Joseph Price says :

"I am satisfied it [opium] has no place in abdominal surgery except in hopelessly malignant cases. Again I am convinced, from prolonged experience and careful observation, that the abdominal surgeon has something important to learn if he does not know how to get along without opium. It will be a revelation to him when he tries carefully and faithfully the 'let-alone' method of management. After sections for all known troubles, so mixed and varied, in the abdomen and pelvis, the pain soon subsides if the patients have been carefully prepared. Without opium you have perfect control of your patient—a cheerful, patient patient. With opium you have lasting discomfort, apprehension and restlessness, a blunting of important centers, a restless patient, coated tongue, a tendency to tympany and nausea. Your patients, after the use of opium, are difficult to nurse.

"For many years I have done large numbers of sections without the use of opiates in any shape. I have the happiest and most comfortable patients I have ever seen in hospitals. . . . Morphine, as commonly used, would be a punishment to both my patients and nurses. It would also favor a mortality that does not exist.

"Abdominal section, where actual disease exists with the opium habit, is the best treatment I know. Nothing will cure the opium

habit so quickly as a section. . . . We have an army of women in America dying from the opium habit—larger than our standing army. The profession is wholly responsible for the loose and indiscriminate abuse of the drug. . . .”

These statements represent the conclusions arrived at after long experience by men whose skill and success are universally admitted. I shall not comment on them or attempt to discuss them but, from theoretical considerations which are borne out by my practical experiences, I am firm in the conviction that, while many cases, perhaps the majority, do not need opium in any form, there are many cases in which the use of an opiate after section is not only good treatment but is demanded by the best interests of the patient. And I venture to state it as a fact that the more severe the operation, the greater the shock, the more intense the “colic” and the more threatening the condition of intestinal paresis or obstruction, the greater is the benefit of an opiate.

To arrive at just conclusions as to whether opium after section is beneficial or otherwise, it is necessary, first, to have a correct and clear knowledge as to its physiological action and, second, to reason from this as to its action with reference to the conditions existing after abdominal operations.

Experimental study has established, according to Bartholow and others, that opium in full therapeutic doses, after a short stage of stimulation, is sedative to the cerebro-spinal and sympathetic nervous systems. It is sedative to the sensory portion of the cerebro-spinal system, relieving pain. It is sedative to the motor portion of the cerebro-spinal system, allaying restlessness.

It is sedative to the vaso-motor portion of the sympathetic system as is shown by the evidences of paresis, manifested by the lessened force and frequency of the cardiac contractions, the fuller, softer pulse, the flushed surface and the injected conjunctivæ.

It is sedative to the general sympathetic system as is shown by the contracted pupil, due to paresis of the pupillary branch of the cervical sympathetic; by the lessened secretion of gastrointestinal glands by reason of paresis of the fibers supplying Meissner's plexus; by the lessened peristalsis due, first, to sedation of the fibers supplying Auerbach's plexus and, secondly, to dilation of the arterioles of the intestinal walls.

Aside from its anodyne and hypnotic properties, its quieting influence on peristalsis is its most marked characteristic. Its tendency to promote constipation is as well known as its ability to quiet pain.

And I think it is generally admitted that it is principally this property or tendency which leads to the condemnation of its use after sections.

That this feeling is unfounded will, I think, be shown by a closer study of its action and the post-operative conditions which generally exist.

Intestinal peristalsis is that rhythmical contraction of the muscular coat of the intestines by which its contents are propelled. It is caused by various agents which act generally through the agency of the sympathetic or vaso-motor nerves supplying the part. Stimulation of the motor branches of the sympathetic nerves which terminate in a fine ganglionic plexus known as Auerbach's plexus, situated in the muscular coat of the intestines, causes contraction of the muscles supplied by such nerves. It has also been experimentally demonstrated by Brunton and others that *stimulation* of the vaso-motor nerves of the intestines, by which the arterioles are *contracted*, *increases* peristalsis; *paresis* of the same nerves, by which the arterioles are *dilated*, *decreases* peristalsis. In other words, excess of *venous* blood causes *increased* peristalsis while excess of *arterial* blood *decreases* it. Also, an *empty* intestine, when the nerve supply is in a normal condition, is generally quiet. Distention of the intestinal canal by gases, fluids or other material stimulates peristalsis either by direct action on the muscular fiber itself or through direct irritation of Auerbach's plexus.

Opium, in *normal conditions of the system*, constipates by reason of its sedative influence on the intestinal sympathetic system—first, by reason of its sedation of those fibers which terminate in the sub-mucous ganglionic plexus, known as Meissner's, which supplies the glands and presides over their function of secretion, thus lessening the quantity of fluid in the canal; secondly, by direct sedation of the motor fibers and Auerbach's plexus; and, thirdly, by sedation of the vaso-motor nerves of the intestines by which the arterioles are dilated and arterial blood becomes in excess.

But it is within the experience of all of you that in certain abnormal conditions a free dose of opium relieves previously existing constipation. Authentic instances of this are too common to need reiteration.

Brunton cites instances of ovarian neuralgia with constipation where the administration of opium to relieve the pain relieved at the same time the constipation.

What is the rational explanation of the fact? It is another appli-

cation of the principle illustrated in the production of perspiration by regulating the surface heat.

In normal conditions the application of artificial *heat* to the surface soon induces perspiration but when the body heat is excessive and the skin dry, *cooling* the surface down to a certain temperature induces perspiration. So with opium. It is always a sedative to the sympathetic nervous system. Sedation of the *abnormally excited* intestinal sympathetic nerve supply quiets its *excessive, irregular* and *obstructive* action and allows *normal physiological* action. This is, without doubt, the correct explanation. Now, what are the conditions after abdominal section and do they in any way contraindicate the use of this drug? Or, in other words, what are the contraindications to the use of opium during the first twenty-four or thirty-six hours after abdominal sections?

It is said to obtund the sensibilities and thus mask symptoms; to cause coated tongue, nausea and subsequent restlessness, with a tendency to tympany (Price). It is said to lessen peristalsis and thus interfere with the production of catharsis. It does quiet restlessness and thus, in cases of secondary hæmorrhage, may tend to obscure important conditions; but by thus quieting restlessness it removes one important danger as to causation of hæmorrhage. In all other cases it is desirable that early pain and restlessness should be quieted. Opium and morphine do undeniably cause in many patients coated tongue, foul breath and almost uncontrollable nausea. This is an objection that is valid and undeniable but, to my mind, it is the only one. The anodyne and sedative qualities are desirable and of great advantage in nearly all sections of any considerable severity; I therefore advocate and use either some salt of codeia, or svapnia (preferably codeine), which retain the anodyne and sedative properties without the nauseating. As early as 1834 Barbier* instituted a series of experiments which indicated to him that codeine had a special sedative influence on the sympathetic system of nerves, especially noticeable in its influence on the plexuses controlling the stomach and bowels. In 1856 Berthe† made much more complete investigations and confirmed Barbier's conclusions that codeine has almost specific action on the sympathetic nerves, and that it lessened the irritability of the intestine to such an extent that a dog, which had received fifteen grains of arsenic and seven and a half grains of codeine, ex-

* *Schmidt's Jahrbuch*, vol. ii, p. 267.

† *Moniteur des hôp.*, 1856.

hibited neither vomiting nor purging nor any other symptom except great drowsiness; while another dog, which had received the same amount of arsenic without the codeine, began to suffer soon from severe vomiting and purging and symptoms of arsenical poisoning.

Brunton* says: "The results I have obtained from the administration of codeine have satisfied me that it has a powerful action in allaying abdominal pain, and it can be pushed to a much greater extent than morphine without causing drowsiness or interfering with the respiration or action of the bowels."

My own use of the drug leads me to conclude that while it quiets abdominal pain and does not in *normal* conditions of the intestines markedly influence peristalsis, when there is exaggerated or irregular contraction of the intestinal muscle it acts as a sedative, quieting excessive action, relieving colic and checking diarrhœa.

For these reasons I now confine myself almost entirely to the use of codeine in abdominal operations where an opiate is indicated.

What, now, are the conditions which render the use of codeine justifiable and advisable?

In my opinion, it is desirable in all cases except those so mild and uncomplicated that the patient recovers from the anæsthetic without depression or appreciable pain. In such cases the "let-alone" treatment is best.

But when there is any degree of shock, when there is vomiting other than that resulting from the anæsthetic or when there is paroxysmal pain, the early and free use of codeine is good practice.

Shock is a condition of depression resulting from a *hyperirritation* of the sympathetic nervous system.† In its treatment clinical experience has almost universally demonstrated the value of opium in some form. Its good effect can be understood if we bear in mind that in shock there is vaso-motor irritation as well as *irritation* of the *entire* sympathetic system and consequent *cardiac* and *arterial spasm*. Opium causes *paresis* of the vaso-motors and general *sedation* of the nervous system and thus antagonizes and relieves the primary conditions of shock.

When vomiting continues beyond the period when it might occur as a result of the anæsthetic it is probably reflex from irritation of some sympathetic ganglion or plexus, possibly constriction of nerves by ligatures, or depends upon interrupted downward peristalsis. In

* *British Med. Jour.*, June 9, 1888.

† Boise. The Nature of Shock. *N. Y. Jour. Gyn. and Obst.*, October, 1893.

such cases the usefulness of a hypodermic injection of some form of opiate has often been demonstrated.

Again, for the pain following many abdominal sections no operator would hesitate to use an opiate were it not for some fear of evil after-effects, based on its well-known nauseating and constipating tendencies. Fortunately, we now have in svapnia and codeine preparations which possess the anodyne or sedative without the nauseating properties of opium and I hope to show that fear as to their tendency to constipate, when used for the relief of conditions immediately following abdominal sections, is groundless.

Let it be kept in mind that the abdominal conditions after section are entirely different from those before. After section the entire abdominal sympathetic is in a condition of severe irritation, either direct or reflex. Irritation of the nerves supplying the intestine causes increased muscular action, increased peristalsis. *Uniformly* increased peristalsis is painless. Irregularly increased, it causes pain.

Colic is irregularly exaggerated, spasmodic peristalsis; when the normal downward peristalsis is re-established—shown by the escape of flatus—the pain is lessened or ceases altogether. The paroxysmal pain after coeliotomy is colic. It is caused by spasmodic contraction of the muscular fibers of the intestinal canal, caused by hyperirritation of the motor nerves. It may exist without the presence of appreciable quantities of gas. The presence of gas is an added excitant and increases the pain.

Fatal intestinal paralysis may be caused by this continuous spasmodic action of the muscles. Let me quote from the *Manual of Human Physiology* of Landois and Stirling. They say (p. 318): "All stimuli applied to the plexus mesentericus increase peristalsis, . . . which may even produce spasmodic contraction of the musculature of the intestine. . . . The *continued* application of strong stimuli causes the dysperistalsis to give place to rest, owing to overstimulation, which may be called 'intestinal paresis' or exhaustion. The continual application of strong stimuli causes complete paralysis of the intestine."

As to the influence of the splanchnic nerve they also say: "The splanchnic is the inhibitory nerve of the small intestine *but only so long as the circulation in the intestinal blood-vessels is undisturbed*. . . . It is also the vaso-motor nerve of the intestines." Therefore stimulation of this nerve, which would occur in any reflex stimulation of the solar plexus, causes primary *transient inhibition* which quickly gives

place to *increased* peristalsis, because of the contraction of the arterioles and consequent increase of venous blood.

What, then, are the conditions after sections? Direct irritation of the intestines by reason of manipulations; direct irritation, it may be also, through injury to the hypogastric or mesenteric plexuses by reason of forcible separation of adhesions; reflex irritation from ligation of the ovarian plexus or nerves of the broad ligaments. In consequence of this, localized spasm of the musculature of the intestines with exaggerated and painful peristalsis above. If the spasm be tonic and persistent, as it sometimes is, obstinate intestinal obstruction occurs, with reverse peristalsis and vomiting and finally intestinal paralysis through muscular exhaustion, and death. Paroxysmal abdominal pain after section indicates irregular spasmodic peristalsis with or without flatus, and the indication is to produce or re-establish normal, painless peristalsis. To accomplish this, it suffices in many cases to wait and encourage the sufferer to bear the pain, as the tendency is always toward a subsidence of the nervous irritation and consequent relaxation of the muscular spasm. In other cases, throwing large quantities of very hot water into the large intestine not only fills the depleted blood-vessels but tends to soothe the irritated nerves and ganglia and thus allow the re-establishment of regular peristalsis. But it is not rational to endeavor to overcome existing irritation by the administration of irritant cathartics. This principle is recognized in cases of painful peristalsis not dependent on abdominal section. Norman Bridge, in his article in the *Reference Handbook of Medical Science*, says: "In severe cases of colic with the most excruciating agony from muscular contractions, often no evacuation results until the system is brought fully under the influence of opium."

Why shall not the same principle hold good in cases of colic following section?

I must conclude, therefore, that the administration of codeine in free doses is often demanded because it does quiet restlessness; it does allay pain, not merely by obtunding the sensibility but by removing the conditions by which the pain is caused; it does not nauseate; it not only will not, under such conditions, constipate but will, on the contrary, place the bowels in the most favorable condition for the production of catharsis when desired.

To sum up, peristalsis may be excited by mechanical distention of the intestines or by irritant material within the intestinal canal, which acts either by direct stimulation of the muscular fiber or by stimula-

tion of the automatic ganglionic plexus within the muscular coat, the motor and vaso-motor nerves supplying the intestines remaining undisturbed. Or the exciting cause may be either direct or reflex, acting through the afferent nerves of the intestines without reference to the condition or contents of the canal itself. In normal conditions of the system an empty intestine is quiet. In properly and carefully prepared patients the intestines at the time of operation and afterward are virtually empty and, other conditions being normal, should be quiet. In point of fact, after nearly all severe abdominal operations, as soon as the patient recovers from the anæsthetic she suffers from paroxysmal abdominal pain, more or less severe. This is generally (and correctly) attributed to intestinal colic—in other words, painful peristalsis. That the assertion that it is due to the presence of gases in the intestines is incorrect a little common-sense reflection will show, inasmuch as there is no more gas or distention at that time than at the time of the operation. The cause of the painful peristalsis must then be from stimulation of the nerve supply of the intestines. This stimulation is in the form of irritation, either directly to the intestines themselves (as from manipulation or separation of adhesions) or directly to the afferent motor or vaso-motor nerves or reflex from irritation of some other portion of the abdominal sympathetic system as, for instance, the nerves of the ovarian plexus or of the broad ligaments. Peristalsis depending upon uneven or localized irritation of the intestinal nerve-supply will be almost of necessity more or less irregular; excessive irritation of certain nerves, with milder irritation of others, may cause *tonic obstructive* spasm of the muscles at the point supplied by the excessively irritated nerves, with increased and painful peristalsis of other portions. To restore normal, physiological peristalsis the indication is to quiet or allay the irritation. No remedy does this so effectually as opium in some form. Of all forms of opiates codeine or some of its salts is the most desirable, because of its known sedative influence on the sympathetic system and freedom from nauseating or other unpleasant after-effects.

After the hyperirritation is allayed the intestines are in a condition to respond to properly administered unirritating laxatives.

